METHOD FOR BACKING UP AND RECOVERING DATA IN A HARD DISK

CROSS REFERENCE TO RELATED APPLICATIONS

This application is the U.S. National Patent Application corresponding to PCT Patent Application No. PCT/CN02/00145 filed on Mar. 12, 2002, which claims priority from Chinese Patent Application No. 01134778.3 filed on Nov. 12, 2001.

TECHNICAL FIELD

The present invention relates to a method for backing up and recovering data in a hard disk of a computer.

BACKGROUND ART

As the most common external storage device, a hard disk is used for storing information of operation systems and a great amount of data, thus its safety and reliability is of great importance. But all the misoperation of users, the defects in hard disk data management software, and the attack of computer viruses may destroy the useful data in the hard disk. So backup of the hard disk data is very important to ensure that some critical data contents can be recovered when necessary.

One of the existing hard disk data backing up methods is to back up the information of a partition or a hard disk as a file, and to open the file during recovery to recover the backed contents into the original partition or hard disk. This backing up method is based on a file system, and once that file system is damaged, the partition where the backed file is stored is deleted due to the attack of viruses, or the partition is damaged so that the file can not be read out any more, then the backed information would be impossible to be recovered. Since such a backup depends on the integrality of the partition where the backed file is stored and the integrality of the backed file itself, the safety of this kind of backup is not guaranteed.

In the existing hard disk data backing up methods, both the backing up and the recovery have some limitations, i.e., either the whole hard disk or a partition is backed up, and the recovery can only be done according to the mode which is taken during the backup. But if a user has different requirements, for example, sometimes the user wants to recover the whole hard disk, while sometimes the user just wants to recover one partition. However, the backup mode for a whole hard disk would not allow the recovery of only one partition thereof, and the backup mode for a partition would not allow the recovery of the whole hard disk. Thus, if both partition and whole hard disk recovering capabilities are required, two backups are needed: one in partition mode, another in whole hard disk mode, which will result in redundance of backup operation, and produce not only waste of human power and time, but also waste of the space in the hard disk.

SUMMARY OF THE INVENTION

The object of the present invention is to provide a method for backing up and recovering computer hard disk data safely and reliably. Computer users can use the invention to back up the data in the hard disk very conveniently and are able to recover quickly the hard disk data damaged by various factors, thus the data safety can be improved.

The technical scheme of the present invention is as follows:

A method for backing up user data in a hard disk according to the present invention, comprises the following steps:

(1) Partitioning at last a segment of hard disk space from the hard disk as a data backing up area;

(2) Backing up a partition status of the hard disk and data to be backed of at least one partition into the data backing up area;

(3) Locking the data backing up area to prohibit other application software or operation systems from accessing the data backing up area.

In the data backing up method of the invention, said data backing up area may be an area space at a higher end of the logic addresses of the hard disk. However, the present invention is not limited to this, generally speaking, the data backing up area of the invention may be placed at any area of the hard disk. But since the Host Protected Area Feature supported by IDE hard disk standards (e. g. ATA5 and following IDE hard disk norms) can only protect the higher end areas, the data backing up area is preferably set at the higher end area. The data backing up area may be either one segment or several segments in the hard disk.

In the data backing up method according to the invention, said locking of the data backing up area and setting of the data backing up area may be implemented by setting the highest address of the hard disk, which may be done automatically, and the highest address is lower than the practical highest address of the hard disk space. Once the highest address has been set up successfully, the sectors in the hard disk which have addresses in between the set highest address and the practical highest space address will not be able to be accessed any more. In locking status, it is impossible for any software to access or amend the contents in the locked area, special commands are needed to load or unload the protection to this area, and thus the safety and reliability of the backed data are ensured. Other locking means may also be used to forbid any access to the data backing up area.

For setting up the highest address of the hard disk, the SET MAX command supported by the hard disk area protection function of the hard disk itself may be used to partition off a higher end area of the hard disk with addresses higher than the highest address, as a data backing up area; hard disk areas with addresses lower than the highest address are used as data areas which the user may use.

In the data backing up method according to the invention, the size of the data backing up area may be determined based on the space size on the hard disk that is practically occupied by the data information. The size of the data backing up area may be larger than that of the space practically occupied by the data. In fact, the present invention only backs up the data, which actually occupy some space, and does not back up any spare space. Thus the least required size for the backing up area can be calculated and the data backing up area with corresponding size may be partitioned off from the hard disk.

During the data backup, the hard disk data may be written into the data backing up area together with some controlling information, the controlling information may comprise the information of: size of the backing up area, starting address of the backing up area, size of the original partition of the backup; number of original partitions, type of the partitions, size of the hard disk partition table, and a mark showing whether the backing up area has been locked successfully. These controlling information are the grounds for the data recovery and locking.

In the data backing up method according to the invention, there may be two different manners for locking the data backing up area as follows:

(1) Permanent locking: when locked, the data backing up area locked at higher end can not be accessed, even when